

*Response Under 37 CFR § 1.116 * – Expedited Procedure – Examining Group 3683
Serial Number: 10/054,253
Docket No. 0545.024*

REMARKS

Without acquiescing to the propriety of the rejections in the Office Action dated July 7, 2004, new claim 33 has been added, and claim 17 has been canceled. Entry of these amendments, reconsideration of the application, and allowance of all claims pending herein is respectfully requested in view of the remarks below. Claims 1-9, 13, 14, 16, 24, 25 and 28-33 are now pending and under consideration.

Elections/Restrictions:

The Office Action has withdrawn claim 17 as depending on claim 15, which was previously withdrawn. New claim 33 incorporates the subject matter of previous claim 17 and depends on claim 16 as original claim 17 was intended to do. Thus, entry of new claim 33 substituting for previous claim 17 is respectfully requested.

Drawings:

The drawings stand objected to because they are alleged to be informal, but sufficient for examination purposes. Applicant is urged in the Office Action to provide formal drawings. Because the drawings are stated to be sufficient for examination purposes, and applicant has been urged, but not required, to provide such formal drawings at this point, applicant defers providing such formal drawings until required to do so in a Notice of Allowability or other communication.

§ 102 Rejections:

Claims 16, 24, and 25 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Teeri (U.S. Patent No. 3,836,195).

Claim 16 of the present application recites an adjustable disc spring system which includes a plurality of beveled disc springs axially aligned with an adjustable spacer which is plastically compressible in a substantially axially direction relative to the plurality of beveled disc springs.

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Teeri discloses a spring pillar assembled from Belleville disc springs aligned parallel to one another and connected by binding rings. FIGS. 4 and 6 disclose deflection of the disc springs in a manner such that the binding rings must be rigid. Specifically, the ends of the disc springs which are received in the binding rings are not deflected while the opposite ends thereof are deflected toward one another. Thus, it is evident from the position of the deflected disc springs in these figures (i.e., the disc springs appear deformed but not the binding rings) that the bindings rings must be rigid. The specification of Teeri also discloses that the binding rings may be made of steel plate rings and further that such binding rings may also be made from an elastic material, such as rubber or synthetic rubber (*See col. 2, lines 57-60 as suggested in Office Action*).

However, there is no disclosure of the binding rings being made of a plastically compressible material, as is recited in claim 16 of the present application. The plastically compressible nature of the spacers recited in claim 16 of the present application allows such spacers to be adjusted or preloaded. More specifically, the spacers may be plastically deformed in a predictable manner which allows them to be adjusted in fine increments to achieve a precise adjustment. For example, as depicted in FIGS. 9-11 of the present application, the deflection or adjustment of such spacers in combination with various disc spring systems may be predicted based on the force applied. The adjustment or preload of such spacers in the various disc spring systems disclosed allow such disc springs systems to be utilized in applications requiring precise adjustments and spacing of different components, for example, in a bearing assembly. However, there is no disclosure of the binding rings in Teeri being adjustable spacers or that adjustment of such binding rings by a force is desirable. In fact, the binding rings in Teeri are described as being elastic and depicted as being rigid but not as being plastically deformable or adjustable. In contrast, the spacers described in the present application are intended to be plastically deformed to particular dimensions to provide a certain spacing, for example, in a bearing assembly. Thus, because an adjustable spacer which is plastically compressible and disc springs axially aligned with such spacers are not identically disclosed in Teeri, claim 16 of the present application cannot be anticipated thereby. Thus, claim 16 is believed to be allowable along with the claims depending thereon which are believed to be allowable for the reasons described and for their own additional features.

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§ 103 Rejections:

Claims 1-6, 8, 9, 13, 14, and 28-32 stand rejected under 35 U.S.C. § 103(a) as being obvious over Teeri in view of Rode (U.S. Patent No. 4,067,585). Specifically, Teeri is alleged to disclose the subject matter recited in claim 1 except for a spacer being plastically compressible to allow axially adjustment in response to a force placed on the spacer, which is alleged to be disclosed by Rode.

Claim 1 of the present application recites an adjustable disc spring system which includes at least one beveled disc spring axially aligned with an adjustable spacer. The adjustable spacer is plastically compressible in a substantially axially direction relative to the at least one beveled disc spring to allow an axial adjustment to the adjustable spacer in response to a force placed on the spacer.

As noted above, Teeri discloses a spring pillar assembled from disc springs aligned parallel to one another and connected by binding rings. The springs are elastic while the binding rings are rigid or elastic. Rode discloses a spacer which is deformable in response to a forced being placed thereon. The deformation in Rode may be elastic and further may be plastic when it is deformed beyond an elastic limit thereof.

However, there would be no reason for one skilled in the art to combine these references. In particular, Teeri lacks the disclosure of a spacer being plastically compressible to allow axial adjustment in response to a force placed on such spacer according to the Office Action. The Office Action alleges that it would have been obvious for one of ordinary skill in the art to have modified Teeri's adjustable disc spring to have included a spacer such as taught by Rode to provide a spacer that can accommodate a multitude of loads. It is further alleged that it would be obvious to use such a spacer which is elastically deformed in a first stage of compression and plastically deformed thereafter such that the spacer would remain rigid. In this manner, a modified spring system of Teeri would be able to accommodate a much wider range of loads as taught by Rode.

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Rode teaches an adjustable spacer which may be plastically deformed to particular dimensions as noted above, but, Teeri does not disclose the desirability of permanently or plastically deforming any portion thereof nor the desirability of combining an adjustable spacer therewith. Instead, there is no disclosure in Teeri of the desirability of achieving the goals outlined in the Office Action as a rationale for combining these references. The mere existence of the Rode spacer does not provide a rationale for combining it with the spring pillar system in Teeri. Teeri discloses conical disc springs being connected by binding rings and specifically discloses that they may be elastic or rigid and that the disc spring pillar is characterized in that it works as both a pressure spring and a tension spring (e.g., it can be loaded in both directions) as described in column 1, but there is no explicit disclosure of the desirability of plastically deforming the binding rings to adjust them. Further, Teeri describes a dynamic load capacity of the springs utilized therein. In contrast, Rode discloses a spacer which is deformed to create a predetermined load on a part which it is desired to maintain under a predetermined constant load as described, for example, in the Abstract. The predetermined constant load as described in Rode teaches away from the dynamic use of the spring pillar such that it may work as both a pressure spring and a tension spring in Teeri. There would be no reason to combine a spacer which is utilized to maintain a predetermined constant load with a spring pillar which acts as both a pressure spring and a tension spring and which receives a dynamic load. In particular, one would not look to a spacer as in Rode to accomplish the purpose stated in Teeri, nor is there any reason or indication to believe that such a combination would satisfy the purposes of Teeri. Moreover, there is no portion of Teeri which is cited as suggesting a combination with Rode, and instead it is only with hindsight reasoning of applicant's invention that these references have been selected and combined in an attempt to support an obviousness rejection of claim 1, and to do so is improper.

Further, if Teeri was combined with Rode as alleged, the combination would be unsatisfactory for the intended purposes of Teeri. For example, col. 1, lines 42-45 and lines 59-65 disclose that the disc spring pillar assembly in Teeri works as both a pressure spring and a tension spring. In particular, Teeri describes the binding rings as being rigid or elastic and the disc springs as being elastic, but not the disc springs or the bindings rings being plastically

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compressible. As noted, the Office Action alleges that it would have been obvious to have modified Teeri's method of adjusting a disc spring system to include a step of plastically compressing a spacer as taught by Rode to achieve a constant desired load from the spacer after the compression in order to be able to use one type of spring system for a wide range of loads instead of having to change out a metal spacer for an elastic spacer or vice versa. However, if the spacer of Rode were to be incorporated into Teeri and the adjustable spacer was plastically compressed to allow an axial adjustment to the spacer in response to a force placed on the spacer, there is no reason from a review of Rode to believe the resulting device would work as a pressure spring and a tension spring. In particular, Rode merely describes the use of the spacer described therein as being useful to create a predetermined load on a part which is desired to maintain a predetermined constant load, but there is no reason to believe that the spacer would provide any desired properties in a situation where it was under both a pressure force and a tension force. Accordingly, there would be no reason for one skilled in the art to combine Teeri and Rode.

Thus, because there is no suggestion or motivation for combining Teeri and Rode, and such a combination would make Teeri unsatisfactory for its intended purpose, claim 1 cannot be obvious over these references. The dependent claims are believed not to be obvious for the same reasons and for their own additional features. Accordingly, claim 1 and the claims depending thereon are believed to be allowable.

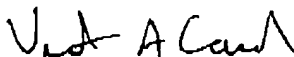
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CONCLUSION

It is believed that the claims of the application are in condition for allowance, and such action is respectfully requested.

If a telephone conference would be of assistance in advancing prosecution of the subject application, the Examiner is invited to telephone the undersigned attorney at the telephone number provided.

Respectfully submitted,



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